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The Brazilian Lobster Industry, 1976

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THE BRAZILIAN LOBSTER INDUSTRY, 1976

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ABSTRACT

Brazil is one of the world's most important lobster fishing nations. Only Australia and Cuba catch more spiny lobster than Brazil. Most of that catch is Caribbean spiny lobster, Panulirus argus, although catches of smooth-tailed Caribbean spiny lobster, P. laevicauda, have increased recently. In 1976, Brazilian fishermen caught about 7,000 metric tons (t) of lobster. Conservation measures have included a closed season and an increase in the minimum tail length of harvested lobster. Almost all of the catch is exported; in 1976, over 6,800 t (live weight), valued at more than US$25 million, were sold abroad. These lobster exports are shipped primarily to the United States. Small amounts are also marketed in Western Europe and Japan.

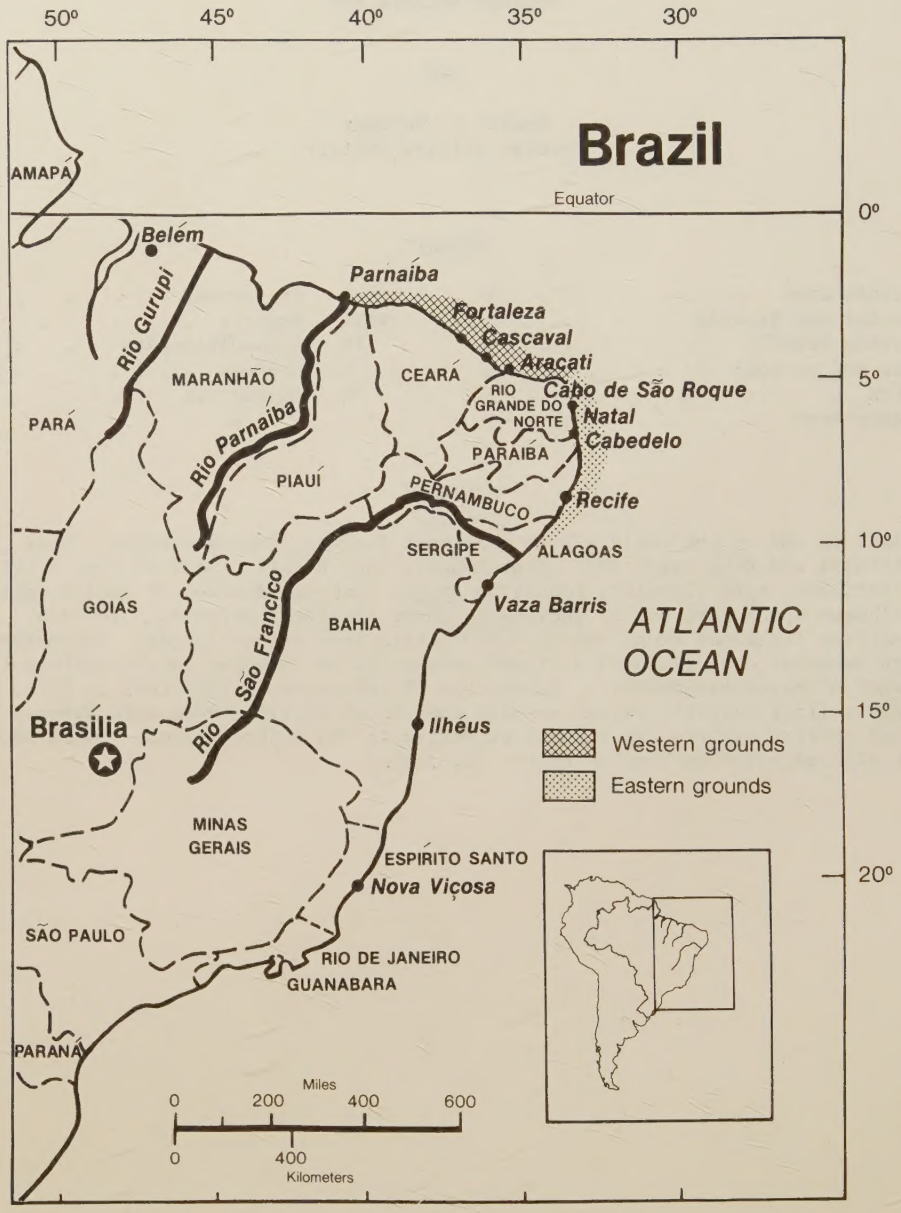


Figure 1.--Map of the Brazilian lobster grounds

I. INTRODUCTION

Brazil, with a land area of 8 million square kilometers (km^2), is the second largest country in the Western Hemisphere (fig. 1). Its 700-km Atlantic coastline extends from a plateau near the equator at 4°N to temperate uplands at 30°S. The Amazon and La Plata river basins constitute about three-fifths of Brazil's total land area. The Amazon basin alone comprises nearly half of Brazil, but it is sparsely populated. About 90 percent of Brazil's 112 million inhabitants live along the coast, especially in the industrialized cities in the central-southern region.

Brazil's 1976 gross domestic product (GDP) was $131 billion. Inflationary pressures have been a major obstacle to a stable economy in recent years; in 1976, the rate of inflation was 46 percent. Agriculture absorbs nearly 40 percent of the labor force; farmers have succeeded in making Brazil one of the world's most important exporters of food products. Brazil's primary export commodities are coffee and cocoa, but iron ore and magnesium exports are also important.

In 1976, Brazil ranked 26th in the world as an important fishing nation in terms of quantity caught.1/ Brazilians, as most other Latin Americans, have traditionally preferred beef to fish; per capita consumption of fishery products was only 2.6 kilograms (kg) in 1970, less than half that of the United States. This small domestic market has hampered the development of the fishing industry. Even so, the Government of Brazil has succeeded, to some extent, in stimulating the industry's expansion by applying fiscal incentives (including reduced taxes), liberal loan policies, and favorable export policies. Over half of these incentives have been awarded to fish-processing companies, because Brazilian officials believed that investment in that sector will stimulate the most employment. The government has also initiated a new aid program to artisanal fishermen.

Fishery exports were 12,500 metric tons (t) in 1976, valued at about $43 million, or 22 percent more than in 1975. The United States is the main export market: over 75 percent of all Brazilian fishery exports were shipped to the United States in 1976. Lobster is by far the most important Brazilian fishery export and represented 59 percent of the value of all fishery exports in 1976. Shrimp and catfish are also important export commodities.

1/ The U.S. Embassy in Brasilia prepares an annual report on the country's fishing industry. For the 1976 report, order report number DIB-77-03-004 for $4.00 from NTIS, Springfield, VA 22162.

II. SPECIES AND GROUNDS

Two species of lobster are found in commercial quantities in Brazilian waters. Traditionally, Caribbean spiny lobster (P. argus, fig. 2) has contributed from 80 to 85 percent of the annual harvest, the rest was mostly smooth-tailed Caribbean spiny lobster (P. laevicauda, fig. 3).

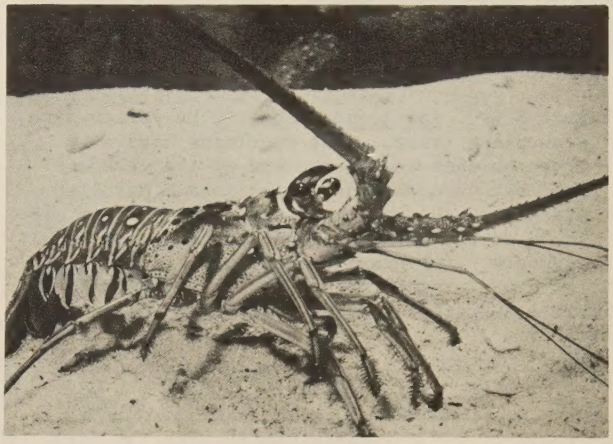


Figure 2.--P. argus can be various colors: gray and tan, brownish blue, olive green, and deep red. It has a pair of large yellow spots with a dark ring around each on the second and sixth segments of the tail and similar, but much smaller, spots on the third to fifth segments. (c) Miami Seaquarium.

In 1976, however, P. laevicauda comprised nearly half of the total Brazilian lobster catch (table 1 and fig. 4). According to officials of the Superintendencia do Desenvolvimento da Pesca (SUDEPE), increased catches of P. laevicauda are the result of a shift in fishing patterns. Lobster fishermen are now reportedly operating farther offshore in waters 20 to 30 meters (m) deep where P. laevicauda is more abundant than P. argus.

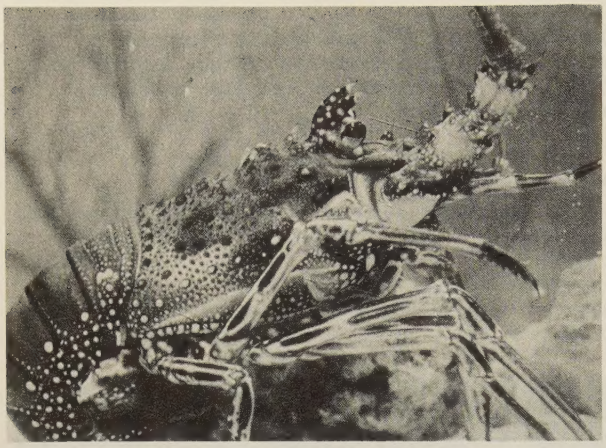


Figure 3.--P. laevicauda tends to be yellow with a purplish tinge. Most specimens have a greenish cast toward the end of the carapace. The legs have alternating white and purplish streaks on the upper surface. White spots are found on the margins of the tail and abdominal segments. (c) Miami Seaquarium.

Table 1.--Brazil. Lobster catch by species, 1973-75

Year	Species		Total
	P. argus	P. laevicauda	
	- - - 1,000 Metric tons - - -		
1973	6.4	1.5	7.9
1974	7.9	1.4	9.2
1975	5.6	1.1	6.7
1976	3.6	3.4	7.0

Source: Ministério de Agricultura, SUDEPE, Chefe da Base de Operaçoes do Programa da Pesca e Desenvolvimento do Rio Grande do Norte. 1977.

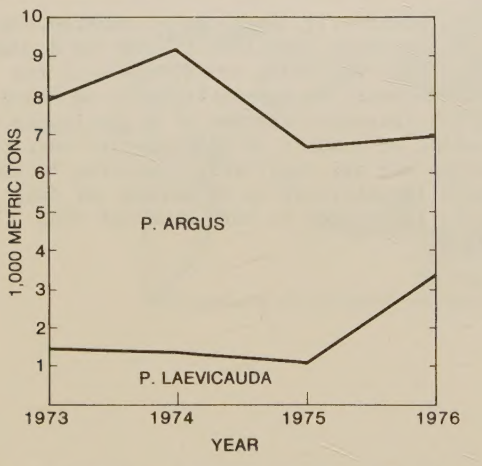
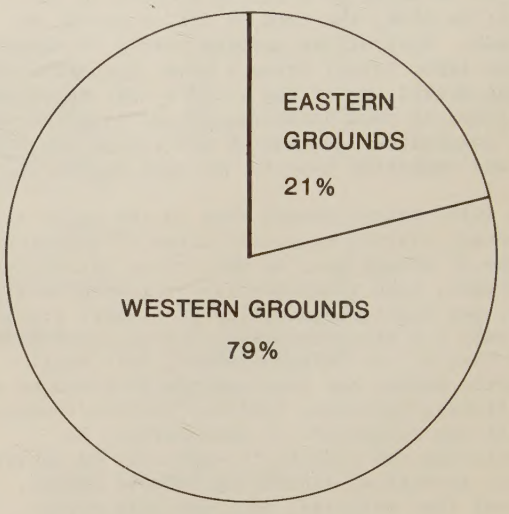


Figure 4.--Brazil. Lobster catch, 1973-76 (Source: Ministério de Agricultura, SUDEPE, Chefe da Base de Operaçoes do Programa da Pesca e Desenvolvimento do Rio Grande do Norte. 1977.)

Lobster fishing is most intensive along the northeast Brazilian coast, between the mouths of the Parnaíba and the São Francisco rivers. The western grounds[2/], where nearly 80 percent of Brazil's lobster is caught, are located along the northeast coast between the mouth of the Rio Parnaíba and the Cabo de São Roque (fig. 1). The two major ports for lobster fishermen in this area are Fortaleza and Aracati. The eastern grounds[3/], which extend from Cabo de São Roque south to the mouth of the Rio São Francisco, only account for about 20 percent of the annual lobster catch (fig. 5). The principal ports on the eastern grounds are Natal, Cabedelo, and Recife.



TOTAL 1976 CATCH - 6,951 METRIC TONS

Figure 5.--Brazil. Lobster catch by grounds, 1976. (Source: Ministério de Agricultura, SUDEPE.)

Recent investigations northwest and south of Brazil's traditional lobster grounds have suggested the existence of additional lobster stocks. Maximum sustainable yield (MSY) studies are currently underway near Belem to ensure that the newly discovered stocks will be properly managed. Off the southern coast, exploitable stocks have been reported near Ilheus (fig. 1), but they probably are not large enough to support an intensive fishing effort. Lobster stocks are also believed to exist farther south near Nova Viçosa, but little is known about the exact location of these fishing grounds or the extent of the resource.

2/ Brazilian scientific literature often refers to these grounds as the northern (or "setentrional") grounds. For geographic uniformity and simplicity, the terms western and eastern are used in this report.

3/ Brazilian scientific literature refers to this area as the eastern (or "oriental") grounds.

III. FISHING VESSELS

Until the early 1960s, Brazilian lobster fishing was carried out by artisanal fishermen from wooden rafts or sailing canoes, called "jangadas," (fig. 6). Jangadas are generally 5 meters (m) long and can carry two to four fishermen. Many of these sail-powered boats work out of fishing beaches along the northeastern coast of Brazil. Artisanal fishermen also use small motorized launches for lobster fishing. Large quantities of spiny lobster from both types of artisanal vessels are landed and sold along fishing beaches.

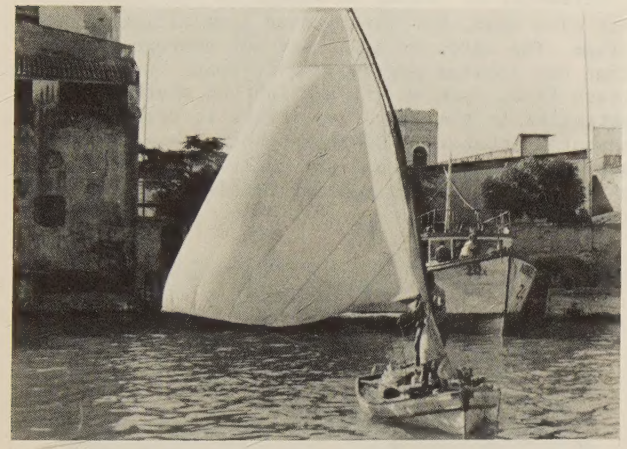


Figure 6.--Artisanal fishing still plays an important role in the Brazilian lobster fishery. Hand-fashioned "jangadas" with sails are common sights in Brazilian fishing ports. (c) Fco. Lira do Rego.

Commercial lobster vessels vary in tonnage from 5 to 25 gross registered tons (GRT) for wooden vessels and up to 700 GRT for the larger steel-hulled vessels (fig. 7).

Figure 7.--Lobster vessels in port at Natal. Note traps loaded on the stern of the vessels. (c) Fco. Lira do Rego.

Information on the number of artisanal vessels engaged in the lobster fishery is not available. Brazilian statistics do indicate, however, that 116 commercial lobster vessels over 20 GRT were registered in 1976 (fig. 8). Over 90 percent of those vessels were registered in the state of Ceará (app. A).

Table 2.--Brazil. Registered lobster fleet, vessel over 20 GRT, 1971-76

Year	Number of vessels
1971	96
1972	51
1973	78
1974	129
1975	111
1976	116

Source: Ministério de Agricultura, SUDEPE, PNUD/FAO. 1977. Boletim do Mercado Pesqueiro 9(11,12):424.

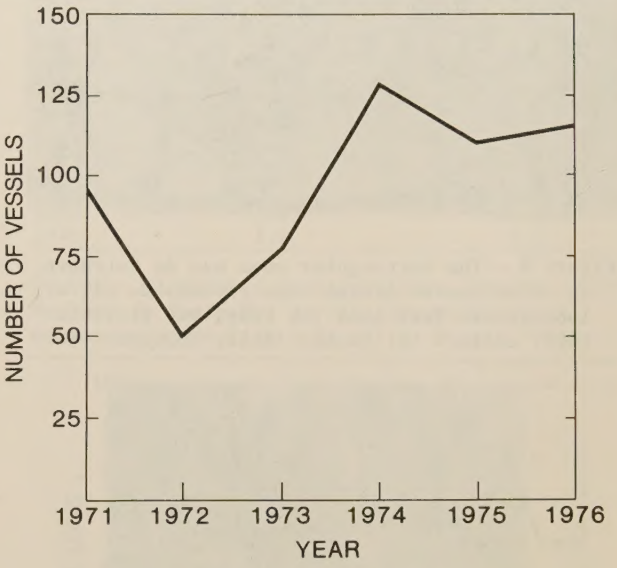


Figure 8.--Brazil. Registered lobster fleet, vessels over 20 GRT, 1971-76. (Source: Ministério de Agricultura, SUDEPE, PNUD/FAO. 1977. Boletim do Mercado Pesqueiro 9(11,12):424.)

At least one Brazilian vessel is currently leased to a foreign enterprise wishing access to Brazilian lobster grounds. San Gabriel Pesca, Ltda., a company in the state of Bahia, has reportedly leased a lobster vessel, the San Gabriel, to Sud Langouste, SARL, a fishing company based in Lyon, France. The vessel is authorized to fish for lobster in Brazilian waters for 1 year as a French-flag vessel.

IV. GEAR AND METHODS

Lobster fishermen generally use traps, locally known as "covos" (fig. 9). The most common type of covo is an irregular hexagonal trap with one entrance. Covos are usually made out of wood and wicker or chickenwire (fig. 10). At first, ox feet were the most commonly used bait, but as the fishery developed, such large quantities of bait were needed that the supply of ox feet proved inadequate. Commercial lobster fishermen now use marine fish caught incidentally by the snapper and porgy fishermen.

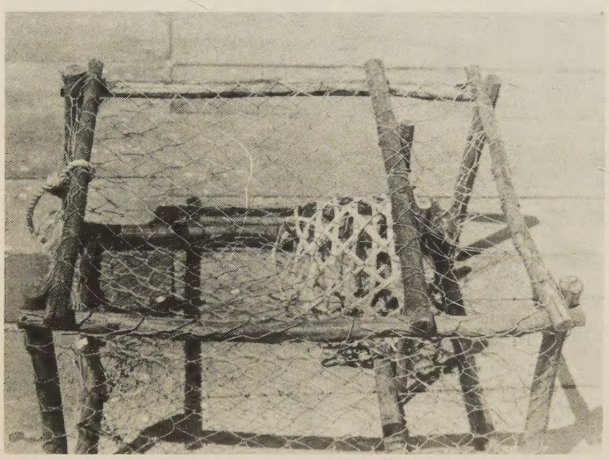


Figure 9.--The rectangular covo has an entrance of woven bamboo strips that expands to allow lobsters to fall into the trap, but prevents their escape. (c) Raulino Sales Sobrinho.

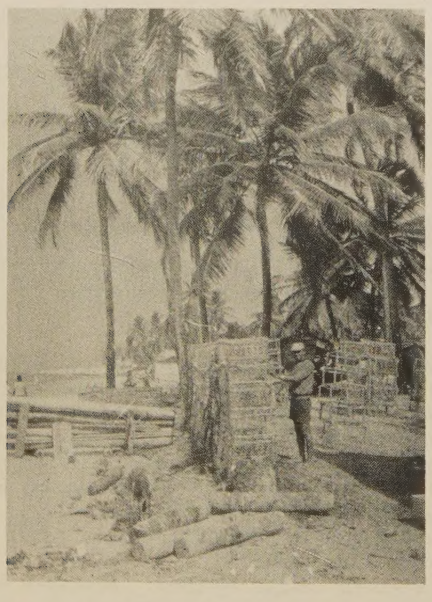


Figure 10.--Chickenwire and wood covos are being cleaned and repaired on shore. (c) Raulino Sales Sobrinho.

Artisanal fishermen set their traps individually; commercial fishermen usually set groups of 10 to 30 traps connected with sisal rope. Research carried out in 1969 off the coast of Cascaval in the state of Ceara found that although fewer traps were set per day by artisanal fishermen, their catch efficiency was greater than that of the commercial fishermen (app. B).[4/] This is perhaps because the artisanal fishermen exercised more care in the placement of their individual traps than is possible when setting strings of traps (fig. 11).

Gillnets, or "redes de espera" in Portuguese, are also used, but have proven less efficient than traps. The catch of a gillnet set averages less than one lobster per day, while about 20 kg of trash fish, such as triggerfish and shark become entangled in the net often trying to reach the ensnared lobsters. Government officials disapprove of gillnets because their use results in the mortality of egg-bearing female and juvenile lobsters.

Figure 11.--Commercial boats, such as this one, can carry over 200 traps. Larger vessels are equipped to carry as many as 800 traps, which are usually set in groups of 10 to 30. (c) Raulino Sales Sobrinho.

V. CATCH

Brazilian fishermen land the world's third largest spiny lobster catch and the world's second largest catch of warmwater lobster species.[5/] Brazilian lobster catches have

4/ Saraiva da Costa, Raimundo, and Roberto Claudio F. Bezerra. 1970. Influencia de metodos de pesca sobre a eficiencia dos covos, na captura de lagostas no Ceará. Laboratorio de Ciencias do Mar Universidade Federal do Ceara. Fortaleza, Arquivos de Ciencias do Mar 10(2):128.

5/ Australian and Cuban lobster catches exceeded Brazilian catches in 1976. Most of the Australian catch is coldwater species, and the Cuban catch is entirely warmwater species.

fluctuated sharply since 1961. With two exceptions, catches were below 4,000 t until 1971. Since 1973, catches have varied between an estimated 6,700 t and 9,200 t (table 3 and fig. 12). Preliminary reports indicate that 8,800 t of lobster was caught in 1977, a 10 - percent increase over the 1976 catch of 7,000 t.

Table 3.--Brazil. Lobster catch, 1961-76

Year	Quantity
	1,000 Metric tons
1961	3.0
1962	4.3
1963	3.5
1964	3.3
1965	3.4
1966	2.8
1967	2.5
1968	3.2
1969	6.3
1970	3.2
1971	E 4.4
1972	E 4.7
1973	E 7.9
1974	E 9.2
1975	E 6.7
1976	E 7.0

Note: E-FAO estimate

Source: Food and Agriculture Organization (FAO). Various years. Yearbook of fishery statistics.

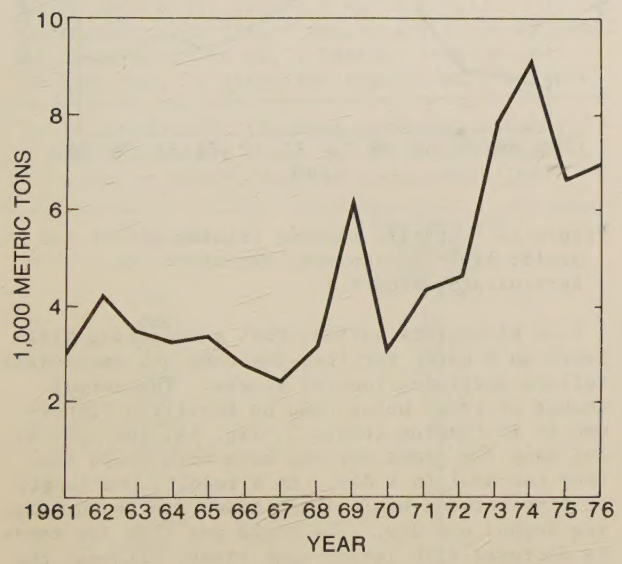


Figure 12.--Brazil. Lobster catch, 1961-76. (Source: Food and Agriculture Organization (FAO). Various years. Yearbook of fishery statistics.)

Statistics supplied to the Branch of International Fisheries Analysis by SUDEPE officials confirm the FAO estimates (table 4). The authors believe an additional confirmation can be obtained by comparing the FAO estimates with Brazilian export statistics, because almost all the Brazilian lobster catch is exported, and export data may be more reliable than catch and landings data. The live-weight equivalent of Brazilian lobster confirms lobster catches ranging from 6,600 t to 9,000 t between 1973 and 1976, very close to the FAO catch estimates (table 4 and fig. 13). U.S. import data further substantiate FAO estimates (apps. C and G).

Table 4.--Brazil. Exports of lobster tails, 1968-76

Year	Quantity	
	Product weight	Live weight
	1,000 Metric tons	
1965	1.1	3.3
1966	1.0	3.0
1967	1.0	3.0
1968	1.7	5.1
1969	2.4	7.2
1970	2.8	8.4
1971	2.2	6.6
1972	2.6	7.8
1973	2.6	7.8
1974	3.0	9.0
1975	2.2	6.6
1976	2.2	6.6

Source: Ministério de Agricultura, SUDEPE, Chefe da Base de Operacões do Programa da Pesca e Desenvolvimento do Rio Grande do Norte. 1977.

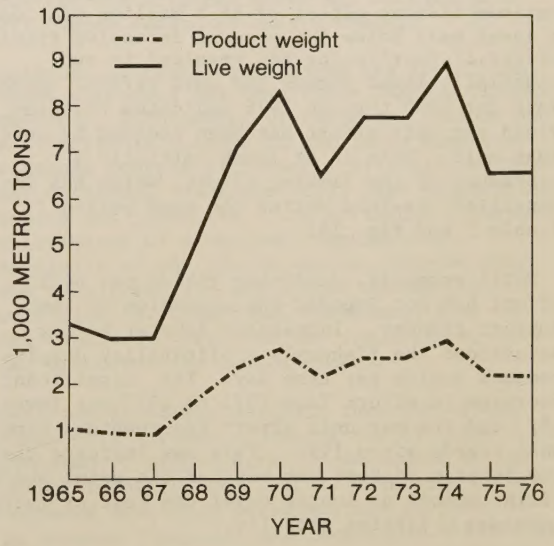


Figure 13.--Brazil. Exports of lobster tails, 1968-76. (Source: Ministerio de Agricultura, SUDEPE, Chefe da Base de Operacoes do Programa da Pesca e Desenvolvimento do Rio Grande do Norte. 1977.)

Catches of 6,700 t to 9,200 t are also in line with estimates of the Brazilian lobster fishery MSY. Several studies of the MSY have been made in recent years. Paiva et al. in 1971, dos Santos et al. in 1973, and Coelho et al. in 1974 all based their analysis on existing catch/effort data with an assumed effort figure of one lobster per trap per day. Although the data and conclusions vary somewhat, the average annual MSY estimate of these studies is about 8,500 t.[6/]

An FAO-sponsored study carried out by the Programa de Pesquisa e Desenvolvimento Pesqueiro do Brazil in 1974 analyzed the amount of lobster caught on both the western and eastern grounds (fig. 1) in relation to the fishing effort, or the number of traps set per day, on both grounds (app. D). Both the annual catch and fishing effort increased between 1965 and 1972. The great increase in the lobster catch on the eastern grounds since 1968, paralleling the increased fishing intensity, seems to indicate an annual MSY of 1,600 t. On the western grounds, although the fishing effort increased significantly, catches remained under 7,000 t. Barring major ecological changes or discoveries of major new lobster grounds, neither of which the authors believe likely, the FAO study would seem to show that the annual MSY estimate of 8,500 t, mentioned in the preceding paragraph, is a realistic assessment.

A stock assessment for the eastern grounds recently released by the Brasilia Unidade de Avaliação de Estoques (UNAVE), suggests a slightly higher annual MSY of 8,800 t. The report acknowledged that the traditional lobster grounds are currently being overfished and suggested a maximum fishing effort of 18.8 million trap days, a level well below the present intensive fishing effort.[7/] Overfishing has resulted in substantially lower yields per unit effort. SUDEPE data for 1965 through 1976 indicates that the yield per unit effort has been reduced by more than half. This is at least partially a byproduct of the fishing effort, which has intensified six-fold during the same period (table 5 and fig. 14).

Until recently, declining yields per unit effort had not impeded the expansion of the lobster fishery. Increasing lobster prices maintained the fishery's profitability despite reduced yields per trap day. The significant increase in effort from 1971 to 1973 has leveled off, and the per unit effort has remained somewhat steady since 1973. This may indicate that the lobster fishery has reached the point where rising prices no longer cover the cost of further increases in fishing activity.

6/ Wise, John P. 1976. An assessment of crustacean resources of the Western Central Atlantic and Northern Southwest Atlantic. FAO, WECAF Studies, No. 2, Rome, p. 48.

7/ Ministerio de Agricultura, SUDEPE, PNUD/FAO. 1977. Boletim do Mercado Pesqueiro (7):236.

Table 5.--Brazil. Lobster fishing effort and yield, 1965-76

Year	Total catch	Fishing effort	Yield
	1,000 Metric tons	Million trap days	Kg per trap day
1965	3.5	3.1	1.12
1966	3.2	4.0	.81
1967	3.1	4.5	.69
1968	5.5	8.3	.67
1969	7.8	13.9	.57
1970	8.3	14.5	.58
1971	7.1	14.7	.48
1972	8.5	22.4	.38
1973	7.9	27.3	.29
1974	9.2	25.6	.36
1975	6.6	24.1	.27
1976	7.0	26.4	.27

Source: Ministerio de Agricultura, SUDEPE.

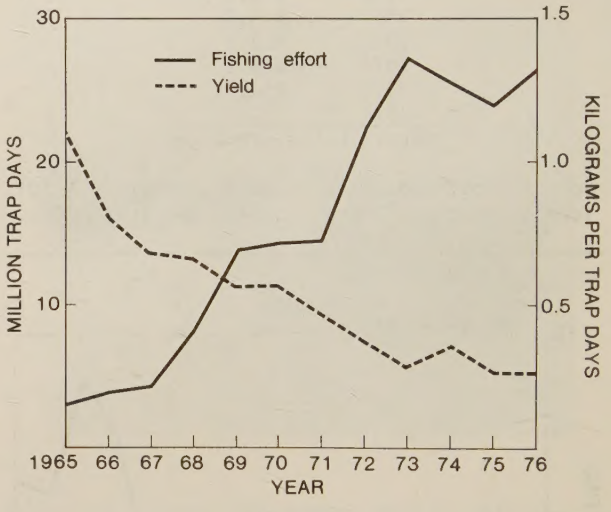


Figure 14.--Brazil. Lobster fishing effort and yield, 1965-76. (Source: Ministerio de Agricultura, SUDEPE.)

Some biologists believe that a declining yield based on a catch per trap day does not necessarily reflect declining lobster stocks. The actual number of traps being used by Brazilian fishermen is increasing (table 5, fig. 14, and app. B), and many fishermen may now have more traps than they can haul in 1 day. As a result, the length of time between hauls (soak time) may be increasing beyond one day. The yield per trap day tends to decrease with longer soak times, although the yield per trap haul could actually be increasing. Many biologists think that catch per haul data would give a more accurate indication of the status of stocks. There are, however, no catch per haul data available on the Brazilian lobster catch. Because the total catch has remained relatively stable since 1970 (table 4 and fig. 13) and the fishing effort has intensified,

the decreased yield per trap day may simply reflect the increased number of traps being deployed by Brazilian fishermen and not diminished lobster stocks.

VI. REGULATIONS

The Brazilian Government has taken several steps to protect lobster stocks. Lobster fishing is limited to licensed fishermen. It is illegal to catch, sell, or transport small lobster with tails less than 12 centimeters (cm) long or egg-bearing females. New tail-length requirements to be adopted in 1978 will increase the minimum length for P. argus to 14 cm gradually over a 3-year period. The minimum tail size for P. laevicauda, a smaller species, will be reduced to 11 cm. The use of trawl nets "cacoeiras," to catch lobster is not permitted, and lobster fishermen cannot carry trawls or aqualungs on their vessels. The government has prohibited trawling and diving because these methods may cause excessive mortality among juveniles and egg-bearing females. Trap fishermen, on the other hand, often return juveniles and egg-bearing females to the sea alive.

SUDEPE instituted a closed season on P. argus and P. laevicauda in 1976 and 1977 in an effort to increase the long-term yield of the lobster fishery. During both years, lobster fishing was prohibited from the mouth of the Rio Gurupi to the town of Vaza Barris (fig. 1) during March and April, because lobster are most abundant during these months. In addition, research has indicated that the occurrence of egg-bearing female lobsters is especially high in February, March, and April (table 6 and fig. 15). Originally, the closed season was to be extended an extra month in 1977, lasting from March through May. A Brazilian regulation (Portaria No. N.002), issued in January 1977, however, modified the original plans and authorized a 1977 closed season of only 2 months.

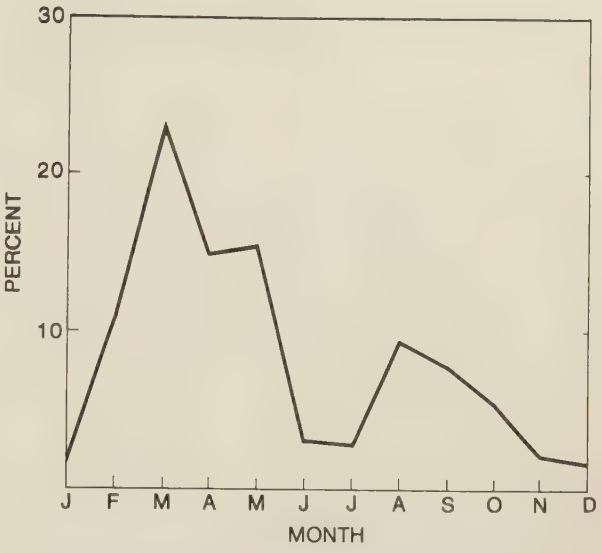


Figure 15.--Brazil. Percent of female egg-bearing lobsters found in the total lobster catch, by month, January to December 1967. (Source: Buesa, René J., M.P. Paiva, and R.S. da Costa. 1968. Comportamiento biológico de la langosta Panulirus argus (Latreille) en Brasil y en Cuba. Revista Brasil Biológica 28(1):67.)

Table 6.--Brazil. Percentage of egg-bearing female lobsters found in the total lobster catch, by month, January to December 1967

Month	Egg-bearing females
	Percent
Jan.	2.1
Feb.	10.7
Mar.	23.2
Apr.	15.0
May	15.6
June	3.2
July	3.0
Aug.	9.5
Sept.	8.0
Oct.	5.7
Nov.	2.3
Dec.	1.8

Source: Buesa, René J., M.P. Paiva, and R.S. da Costa. 1968. Comportamiento biológico de la langosta Panulirus argus (Latreille) en Brasil y en Cuba. Revista Brasil Biológica 28(1):67.

Violators of these regulations are fined, and repeat offenders may have their fishing licenses canceled. Enforcement of these regulations has been difficult because of the large number of artisanal lobster fishermen. Officials believe many artisanal fishermen still take egg-bearing females and juveniles. The artisanal fishermen are critical of government regulations, especially of the closed season, because they have no alternative livelihood during the 2-month closure. Commercial fishermen, most of whom reportedly obey the new regulations, have also protested the closed season.

Brazilian fishermen maintain that the closed season only serves to disrupt the livelihood of thousands of people directly dependent on the lobster industry, and that it adversely affects companies providing equipment and supplies to the lobster fishermen and processors. Fishermen point out that not only is the largest amount of lobster caught in March and April, but also that U.S. lobster prices tend to be highest in May, June, and July, when March and April Brazilian

catches would normally reach the U.S. market.[8/] In addition, finfish, such as red snapper, tuna, and shark, do not appear in great abundance in northeastern waters until after August, thus making it more difficult for fishermen and processors to adjust to the March-April closure by entering other fisheries.

Few lobster fishermen are currently fishing for other species. Almost 95 percent of the lobster fleet was inactive during the 1977 closed season. Some vessels were being repaired, and members of many worker associations received vacations during that period. A major reason for the inactivity may be the lobster fishermen's lack of knowledge about the fishing methods and grounds for other species.

In 1977, the United Nations' Development Program (UNDP), an agency of the U.N. Food and Agriculture Organization (FAO), and SUDEPE cosponsored a study of the adaptability of idle lobster fishermen to finfish fisheries. The study of four lobster vessels that spent the closed season fishing for mackerel, tuna, bonito, marine catfish, and barracuda revealed that the lobster fishermen's efforts were impaired by their lack of experience and by the slow maximum speed of the lobster vessels.[9/] Although SUDEPE maintains that the main obstacle to the switch from lobster trapping to finfish trawling is the education of the lobster fishermen and not financial considerations, the shift would require expensive modifications of lobster vessels as well as the purchase of trawl nets and other fishing gear. This expense has probably deterred many fishermen from attempting such a seemingly advantageous adjustment.

In response to complaints by the lobster industry, SUDEPE has arranged for a CR$100 million[10/] (US$ 17.5 million) credit to assist lobster processors during the closed season. In addition, the state of Ceará has lowered the market circulation tax from 10 to 5 percent. This tax is imposed on small processing companies when they sell their products to large exporting firms.

Brazilian officials have acknowledged that industry resistance has made the extension of the closed season beyond 2 months nearly impossible and the 2-month closure ineffective. For the past 2 years, lobster fishermen have circumvented the government's goal of reducing the annual lobster fishing effort by constructing additional traps during the closed season which they use once the ban is lifted.

Fishing industry and U.S. sources in Brazil report that SUDEPE is planning to institute a 1978 closed season from September to December. This closure appears to be a compromise between the government's objective to lower the total lobster catch and the fishing industry's desire to minimize the effects of limited lobster catches.

Fishing authorities are now considering the use of other methods to conserve Brazil's lobster resources. Government officials and industry representatives met in September 1977 to discuss the possible implementation of a nationwide annual lobster quota. According to government sources, the fishing industry is not opposed to quota allocations by state and by company. Although Brazilian officials believe state quotas are a viable solution, they doubt whether quotas for individual companies are desirable or administratively feasible given the large number of Brazilian companies participating in the lobster fishery.

VII. PROCESSING

The production of frozen lobster tails of export quality began in 1955. At that time, the catch was landed live because the artisanal fishermen who originally fished lobster, lacked any method of preserving the catch in their small jangadas. As the fishery developed, larger vessels were equipped to keep the catch alive in holds or to preserve the tails on ice. On these vessels, the lobsters are beheaded and stored in iced urns that keep the tails fresh for a period of up to 8 days. The heads are usually discarded at sea on the lobster grounds. Brazilian authorities have attempted to discourage this practice because the discarded heads may draw sharks and other predators and pollute the grounds, causing the lobsters to leave (fig. 16).

Today, many of the larger Brazilian vessels have refrigerated holds to preserve the catch (fig. 17). Although Brazilian authorities now recommend that the catch be landed live and beheaded at the processing plant, most Brazilian fishermen still behead the catch on the fishing grounds. Once the catch is landed, the tails are "deveined," cleaned, frozen, and packaged for export.

In the past, Brazilian processors have had quality control problems. Some processors did not use potable water when making the ice used to preserve the catch or to wash the tails at the processing plant. In addition, a common method of deveining the tails was to draw out the vein with the spines on one of the lobster's antenna, a practice that sometimes impaired the

8/ Although SUDEPE officials acknowledge that lobster catches are greater in the spring, the National Marine Fisheries Service has no monthly catch data. U.S. statistics do indicate, however, that prices for warmwater tails tend to peak in May, June, and July.

9/ Ministerio de Agricultura, SUDEPE, PNUD/FAO. 1977. Diadorim. Programa de Pesquisa e Desenvolvimento Pesqueiro do Brasil, Cruzeiro No. 3, Rio de Janiero, p.7.

10/ Brazilian cruzeiros.

Figure 16.--Boats land directly on the beach near this spiny lobster and fish buying station in Rio Grande do Norte. Lobster and fish are brought to the station, placed on ice (if available), and picked up by the buyer's truck 3 times weekly. (c) William H. Stevenson.

Figure 17.--Although many of the larger commercial vessels have refrigerated holds, smaller vessels, such as this one, keep lobsters alive in holds or preserve their tails on ice. (c) Raulino Sales Sobrinho.

quality of the tail meat. It is not known to what extent this practice continues today.

Almost all of the Brazilian catch is processed as frozen tails. Brazilian processing plants export a large amount of tails from juvenile lobsters. In 1973, nearly one-third of all Brazilian lobster exports were less than 0.11 kg (4 oz) each. In 1974, that proportion had increased to almost half of all exports (table 7). More recent data on the size composition of tail exports are not available. The live weight of lobster with 0.11-kg tails is

Table 7.--Brazil. Lobster tails exported from Fortaleza, by size, 1973-74

Tail size	1/Boxes			
	1973		1974	
Ounces	Number	2/Percentage	Number	2/Percentage
2 - 4	102,987	28.8	189,606	45.9
4 - 6	92,392	25.9	80,576	18.5
6 - 8	97,781	27.4	72,454	17.6
8 - 10	49,260	13.8	49,394	12.0
10 - 12	14,698	4.1	20,684	6.0
12 - 14	-	-	148	negl.
Total	357,118	100.0	412,862	100.0

1/ 10 lb

2/ Refers to the percentage of boxes of each size of tail.

Sources: Pinto Paiva, Meliquiades. 1974. Estudo sobre a pesca de lagosta no Ceará, durante o ano de 1973. Laboratorio de Ciencias do Mar de Universidade Federal do Ceará, Fortaleza. Arquivos de Ciencia do Mar 14(1):38 and 1975. Estudo sobre a pesca de lagosta no Ceará, durante o ano de 1974. Laboratorio de Ciencias do Mar de Universidade Federal do Ceará, Fortaleza. Arquivos de Ciencias do Mar 15(2):115.

about 0.34 kg (12 oz), a weight indicative of immature lobsters. Increased use of lobster in U.S. restaurants has created a significant market for the smaller tails, particularly in the popular "surf and turf" combination. It is not known, however, what combination of factors caused the sharp increase in shipments of small tails in 1974. The catching and processing of such a large quantity of juveniles may reduce the future abundance of lobster on the present grounds, especially if the high proportion of small tails exported in 1974 continues.

The Brazilian Government, in previous years, has tried to persuade producers to utilize the entire lobster by processing meat, paste, meal, or solubles from the carapace of the lobster, but has met with little success. A technical laboratory in Brazil has recently developed new processing methods, and the government is again encouraging Brazilian companies to begin production of nontail commodities.

Most of the lobster processing plants are located in the northeastern states of Ceará, Rio Grande do Norte, and Pernambuco. Many of these companies also process snapper, porgy, shrimp, and scallops in addition to lobster. Appendix E lists the names and addresses of Brazil's major lobster producing firms.

VIII. EXPORTS

Most of Brazil's catch is exported. No information is available on the domestic consumption of lobster, but it is known to be small. Based

on the data in appendix B, 89 percent or more of the catch has been exported since 1972. Lobster exports in the 1970s have grown to over 50 percent of the total value of all Brazilian fishery exports. Frozen lobster exports have increased from about 1,700 t in 1968 to 2,500 t in 1975.[11/] The increase in value, due to rising lobster prices, has been even more substantial. Lobster exports increased in value from US$5.5 million to US$21.5 million, or by almost 400 percent, during that same period (table 8 and fig. 18).

Table 8.--Brazil. Lobster exports, 1968-76

Year	Quantity	Value
	1,000 Metric tons	US $1,000
1968	1.7	5.5
1969	2.5	10.2
1970	2.8	10.0
1971	2.5	12.8
1972	2.6	16.4
1973	2.5	18.0
1974	3.0	27.8
1975	2.5	21.5
1976	2.4	25.2

Source: Ministério de Agricultura, SUDEPE, PNUD/FAO. 1977. Boletim do Mercado Pesqueiro 8(5):137, and Boletim do Mercado Pesqueiro 9(8):284.

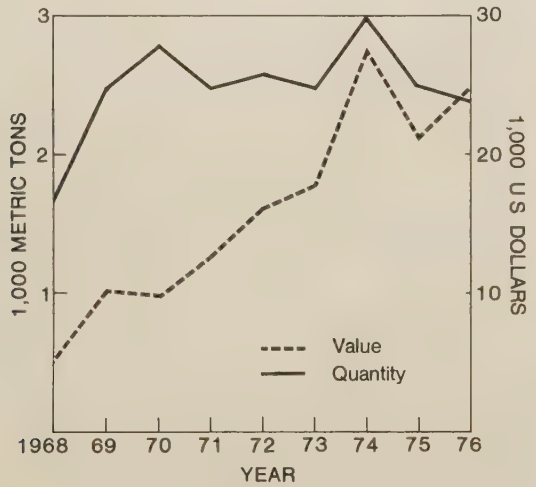


Figure 18.--Brazil. Lobster exports, 1968-76. (Source: Ministério de Agricultura, SUDEPE, PNUD/FAO. 1977. Boletim do Mercado Pesqueiro 8(5):137, and Boletim do Mercado Pesqueiro 9(8):284.

Most Brazilian lobster exports are shipped through the port of Fortaleza in Ceará, where the Brazilian Association of Lobster Exporters (ASBEL) is located. In 1976, about 1,760 t of lobster, 78 percent of the total lobster exports, were shipped through Fortaleza. In that same year, nearly 470 t were exported from Recife in Pernambuco.[12/] In addition, small amounts were also shipped through Natal, Cabedelo, and Santos.

Seasonal data on total lobster exports are not available. Data for Fortaleza, constituting most of Brazilian lobster exports, indicate that shipments generally peak between March and August. Owing to the closed season during March and April 1976, the monthly volume of exports fluctuated more in that year (table 9, fig. 19, and app. F).

Brazilian exports are marketed throughout the world, although 90 percent of all shipments are to the United States. These shipments declined from 2,800 t in 1974 to less than 2,400 t in 1975 and 1976, according to U.S. import data (app. G). Brazilian export statistics indicate that the declining U.S. imports in 1975 were due to reduced total lobster exports and slightly increased sales to Europe and Japan (app. H and I). The continued reduction in 1976 seems part of the general decline in Brazilian lobster exports and may have been influenced by the 1975 closed season. The seasonal closure in March and April 1975 does not seem to have affected U.S. imports, however, because the amounts imported in 1975 and 1976 are almost identical (app. G) Almost all U.S. lobster imports from Brazil are frozen tails.

Table 9.--Brazil. Exports of lobster, 1962 to 1975 average, 1976, and January to May 1977

Month	Quantity		
	1962-75 average	1976	1977
	- - - - Metric tons - - - -		
Jan.	66.0	82.2	106.4
Feb.	94.6	169.9	175.7
Mar.	132.0	79.2	79.5
Apr.	142.1	1/0	3.6
May	152.8	158.8	163.8
June	155.2	223.3	NA
July	143.6	201.2	NA
Aug.	113.9	135.5	NA
Sept.	111.6	135.9	NA
Oct.	117.5	228.9	NA
Nov.	139.7	202.8	NA
Dec.	139.2	154.5	NA

Note: NA - Not available

1/ The absence of lobster exports in April 1976 is a result of the closed season in effect for March and April 1976.

Source: Ministério de Agricultura, SUDEPE, PNUD/FAO. 1977. Boletim do Mercado Pesqueiro 9(2):59.

11/ Both figures are product weight.

12/ Ministerio de Agricultura, SUDEPE, 1977. Boletim do Mercado Pesqueiro 9(8):284.

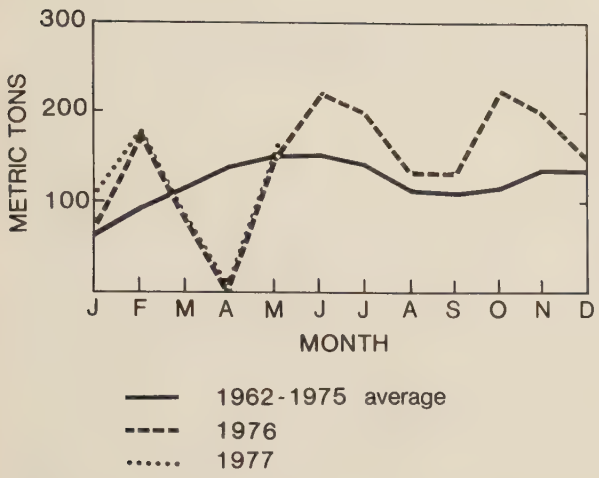


Figure 19.--Brazil. Exports of lobster, 1962-75 average, 1976, and January to May 1977. (Source: Ministério de Agricultura, SUDEPE, PNUD/FAO. 1977. Boletim do Mercado Pesqueiro 9(2):59.)

IX. ACKNOWLEDGMENTS

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Appendix A--Brazil. Registered lobster vessels greater than 20 GRT, by port, 1976.

State of registry	Port of registry	Number of Vessels
Ceará		
	Acarau	2
	Aracati	14
	Camocim	1
	Fortim	7
	Fortaleza	9
	Mucuripe	79
	Paracuna	2
	Parajura	3
	Unknown	6
Total		1/ 114
Pernambuco		
	Recife and Natal	2
	Unknown	1
Total		3
Others		3
Total		2/ 120

1/ The column does not total 114, the actual number of lobster vessels officially operating in Ceará, because several vessels are registered in more than one port.

2/ These data were released in May 1977, which may explain the slight discrepancy with the information in Figure 4, published in November and December 1977.

Source: Ministério de Agricultura, SUDEPE. 1977. Anuario do registro geral da pesca. Brasilia, p.129-243.

Appendix B--Brazil. Comparison of the catch efficiency of the single lobster trap method used by artisanal fishermen and the interconnected trap method used by commercial fishermen off the coast of Cascaval, Brazil, 1965-68

Year	Catch Effort			Lobster yield		
	1/Fishing days	Trap days	Average number of traps set per day	Total catch	Per fishing day	Per trap
	Number					
Artisanal						
1965	6,525	114,444	17.5	501,936	76.2	4.4
1966	5,078	75,962	15.0	336,594	66.3	4.4
1967	3,422	48,436	14.2	357,620	104.5	7.4
1968	8,328	119,524	14.4	1,009,234	132.0	9.2
Commercial						
1965	21	1,900	90.5	3,422	163.4	1.8
1966	501	47,697	95.2	84,423	168.5	1.8
1967	1,140	144,185	126.5	301,576	264.5	2.1
1968	904	159,425	176.4	315,056	348.5	2.0

1/ Based on the number of jangadas and motorized vessels multiplied by the number of actual fishing days.

Source: Saraiva da Costa, Raimundo, and Roberto Claudio F. Bezerra. 1970. Influencia de metodos de pesca sobre a eficiencia dos covos, no captura de lagostas no Ceará. Labortorio de Ciencias do Mar de Universidade Federal do Ceará, Fortaleza. Arquivos de Ciencias do Mar 10(2):128.

Appendix C.--Brazil. Catch and comparison with live-weight equivalents of total lobster exports and U.S. lobster imports from Brazil, 1973-76

Year	Catch			Exports		Total U.S. imports	
	P. argus	P. laevicauda	1/Total	Product weight	2/Live weight	Product weight	3/Live weight
	1,000 Metric tons						
1973	6.4	1.5	7.9	2.5	7.5	2.7	8.1
1974	7.9	1.4	9.2	3.0	9.0	2.8	8.4
1975	5.6	1.1	6.7	2.5	7.5	2.4	7.2
1976	3.6	3.4	7.0	2.2	6.6	2.4	7.2

1/ Totals may not agree owing to rounding.

2/ The live weight has been calculated by converting the product weight to live weight at a ratio of 1 to 3, because it is believed almost all the Brazilian catch is processed as frozen tails. (The tail is about one-third a spiny lobster's weight.)

3/ The live weight has been calculated by converting the product weight to live weight at a conversion rate of 1 to 3 for tails and other frozen meat and 1 to 4.63 for the small amount of canned lobster produced in 1975.

Source: Brazilian catch and export data: Ministério de Agricultura, SUDEPE, Chefe da Base de Operações do Programa de Pesquisa e Desenvolvimento do Rio Grande do Norte, Brazil, 1977; U.S. import data: U.S. Department of Commerce, Bureau of the Census.

Appendix D.--Brazil. Total catch and fishing effort in the northeastern lobster fishery, 1965-72

Year	Total catch		Fishing effort	
	Western grounds	Eastern grounds	Western grounds	Eastern grounds
	Metric tons		Million trap days	
1965	2,562	963	2.0	1.0
1966	2,538	722	3.0	0.9
1967	2,871	282	4.0	0.5
1968	4,593	779	6.0	1.2
1969	6,168	1,577	11.9	2.4
1970	6,546	1,319	11.5	3.7
1971	4,449	1,648	12.3	2.7
1972	6,330	1,994	15.9	6.0

1/ The discrepancies between these data and those of table 5 may be the result of rounding or differing methods of data collection.

Source: Ministério de Agricultura, SUDEPE, PNUD/FAO. 1974. Relatorio de primera reunião de grupo de travalho e treinamento (G.T.T.) sobre availicão dos estoques. Programa de Pesquisa e Desenvolvimento do Brasil, Serie Documentos Tecnicos No. 7, Rio de Janeiro, p. 83.

Appendix E.--Brazil. Major Brazilian lobster-producing firms

Amazônia Indústrial e Comércio de Pesca Ltda.
Av. da Abolicao, 5301
Fortaleza - CE - 60.000
Established: 1961
Manager: Afonso Henriques Fontes Neto
Nominal capital: Cr$2.2 million[1/]
Fixed assets: Cr$4.5 million
Reserve: Cr$0.5 million
Plant: Rua Jose Avelino, 503 a 509
Fortaleza - CE - 60.000
Branch office: Rua Senador Alencar
s/nº Cascavel - CE
Products: frozen lobster tails
Production (1975): 177t, worth Cr$15 million

Cia. Amazonica de Pesca (CIAPESC)
Rodovia Arthur Bernardes, km 14.5
Belem - PA - 66.000
Products: lobster and shrimp

Cia. Langosteira de Exportacão (COMPEX)
Av. Cesar Cals, 200
Fortaleza - CE - 60.000

Cia. Norte Brasileira Langostabras
Fortaleza - CE - 60.000

Cia. Nacional de Frigoríficos (CONFRIO)
Rua José Bonifácio, 176 - 10.º and.
São Paulo - SP - 11.6000
Established: 1964
Manager: José Parma
Nominal capital: Cr$90.5 million
Fixed assets: Cr$128.7 million
Reserves: Cr$80.3 million
Plant: Rua Cap. Luiz Soares, 462
São Sebastião - SP
Employees: 20 technicians, 339 workers, 219 administrators
Branch offices: Acurui, Aracati, Belem, Brasilia, Cananeia, Fortaleza, Itajai, Natal, Recife, Rio de Janeiro, Santos, Sao Jose do Norte
Products: frozen lobster, shrimp, scallops, and other fish
Production (1975): Cr$147.7 million

Comercio, Pesca e Export. Ltda. (COPEX)
Av. Vicente de Castro
s/nº Mucuripe
Fortaleza - CE - 60.000

Delmar Productos do Mar, S.A.
Av. Cesar Cals, 150
Fortaleza - CE - 60.000
Established: 1968
Manager: John Williame
Nominal capital: Cr$11.2 million
Plant: same address as above
Branch office: Rua da Praia
s/nº Camochim - CE
Products: lobster tails, fish fillets, and whole frozen fish

Empresa Brasileira da Pesca Ltda.
Praia do Matariz
Ilha Grande
Angra dos Reis - RJ - 27.300

Empresa Brasileira de Pesca (EMPRAPESCA)
Rua Gal. Clarindo de Queiroz, 1387
Fortaleza - CE - 60.000
Products: fresh and frozen lobster tails

Empesca S.A. Construções Navais, Pesca e Exportação
Rua Chile, 84
Natal - RN - 59.000
Established: 1971
Manager: Elmo Ronaldo Teixeira de Carvalho
Nominal capital: Cr$12 million
Authorized capital: Cr$16 million
Fixed assets: Cr$7 million
Reserves: Cr$0.8 million
Plant: same address as above
Employees: 17 technicians, 100 workers, 4 administrators
Branch office: Av. Jose Satoia, 888
Fortaleza - CE
Products: frozen lobster and fish fillets
Production (1975): 116t, worth Cr$5.7 million

Fortaleza Pesca Ltda.
Av. da Abolicao, 5031
Mucuripe
Fortaleza - CE - 60.000
Products: fresh and frozen lobster, and porgy and yellowtail snapper fillets

Frio Pesca Com. Ind. S/A (FRIPESCA)
Av. Brasil
Mercado S. Sebastiao
Rio de Janeiro - RJ
Products: frozen lobster tails and shrimp

Frigorifico Espiritosantense de Pescado (FRIESP)
Rua Horacio R. Loureiro, 7
s/loja - Vitoria - ES
Products: frozen whole lobster and tails, and frozen shrimp

Industria de Fio e Pesca Ltda. (IPESCA)
Av. Almirante Barroso, 501
Fortaleza - CE - 60.000

Industria de Pesca S.A.
Rua da Assembleia, 93
11 andar (escrit.)
Rio de Janeiro - RJ
Products: lobster tails and frozen shrimp

1/ Although not specified, Brazilian cruzeiro values cited by sources were probably based on 1975 data. The exchange rate for the Brazilian cruzeiro in June 1975 was US$0.079.

Appendix E. (continued):

Indústria de Pesca do Ceará S.A. (IPECEA)
Av. Vicente de Castro, s/nº
Fortaleza - CE - 60.000

Indústria de Pesca Maritima Ltda. (MAPIN)
Av. Dr. Jose Saboia, 1001
Praia do Futuro
Fortaleza - CE - 60.000

Itapesca Comércio e Indústria Ltda.
Rua do Brom,145
Recife - PE - 50.000

Lobster do Brasil - Indústria e Comércio Ltda.
Rua da Concórdia, 153 c.j. 804
Recife - PE - 50.000

Masakasu Nishidate
Av. do Rocio, 327
Iguape - SP
Products: lobster and shrimp

Nordeste de Pesca Ltda. (NORPESCA)
R. Coronel Solon, 112/114
Areia Branca - RN - 59.620
Product: lobster tails

Norte Pesca, S.A.
Av. República do Libano, 243
Recife - PE - 50.000
Established: 1961
Manager: Moacir Cadneiro Leão
Nominal Capital: Cr$5.4 million
Employees: 4 technicians, 100 workers, 16 administrators
Branches: Natal
Products: frozen and cooked lobster and fish
Production (1975): frozen tails - 108 t, cooked lobster - 110 t, fish - 872 t, worth Cr$6.2 million

Pesca Alto Mar Ltda.
Rua Chile, 102
Natal - RN - 59.000

Pesca, Importação e Exportação Ltda. (PEIMPEX)
Av. da Abolicao, 4521
Mucuripe - CE - 60.000
Established: 1963
Nominal capital: Cr$11.1 million
Authorized capital: Cr$50 million
Fixed assets: Cr$18.9 million
Reserves: Cr$2.7 million
Plant: same address as above
Employees: 20 technicians, 200 workers, 20 administrators
Products: lobster tails and fish fillets
Production (1975): 619 t worth Cr$19.9 million

Pesca Indústrial S.A. (MARIMAR)
Rua da Concórdia, 153 C. 707
Recife - PE - 50.000
Products: lobster tail

Pescatlan S.A.
Rua José Bonifácio, 10º andar
San Paulo - SP
Products: frozen lobster, frozen shrimp and scallops

Productos de Pesca e Exportação Ltda. (PRODUPESCA)
Rua Chile, 102 - Riveira
Natal - RN - 59.000

Propesca Ltda.
Av. Cesar Cals
Fortaleza - CE - 60.000

Representação, Exportacão e Pesca Ltda. (REP)
Av. da Abolicao, 3705 - S/101
Fortaleza - CE - 60.000
Products: fresh and frozen lobster tail, and porgy and yellowtail snapper fillets

Sociedade de Pesca do Nordeste S.A. (SOCIEPESCA)
Av. Almirante Barroso, 501
Fortaleza - CE - 60.000
Products: fresh and frozen lobster tails, and porgy and yellowtail snapper fillets

Sociedade de Pesca Ltda. (SOPESCA)
Rua José Avelino, 293
Fortaleza - CE 0 60.000
Products: fresh and frozen lobster tails, and porgy and yellowtail snapper fillets

Sociedade Importadora e Exp. Ltda.
Av. Beira Mar s/n
Cabedelo - PB - 58310
Product: lobster tails

Sul Americana de Pesca e Exportacão S.A. (SUAPE)
Rua Chile, 164
Ribeira
Natal - RN - 59.000
Product: lobster tails

União Brasileira de Frio e Pesca Ltda. (UNIPESCA)
Av. da Abolicao, 5451
Mucuripe
Fortaleza - CE - 60.000
Products: fresh and frozen lobster tails, and porgy and yellowtail snapper fillets

Sources: Ministério de Agricultura, SUDEPE, PNUD/FAO. 1976. Boletim do Mercado Pesqueiro 8(7):225-229.

Revista Nacional da Pesca. 1977. Empresas da pesca. Anuário da Pesca, 1976, São Paulo, p.35-52.

Appendix F.--Brazil. Lobster exports by month from Fortaleza, Brazil, 1962-May 1977.

Year	Quantity					
	Jan.	Feb.	Mar.	Apr.	May	June
	Metric tons					
1962	30.8	71.1	44.3	24.0	127.6	162.8
1963	50.0	58.6	63.3	47.5	85.8	125.3
1964	11.9	23.7	30.4	24.5	43.6	127.1
1965	46.2	22.5	86.2	72.2	99.1	54.7
1966	71.2	30.5	85.4	78.5	102.2	111.8
1967	32.6	23.4	49.4	44.6	45.3	78.0
1968	67.3	96.7	112.1	117.2	159.5	115.1
1969	83.5	184.0	202.2	210.0	178.6	77.8
1970	104.3	187.3	208.2	170.1	278.9	299.0
1971	100.8	118.7	146.9	226.3	181.0	170.6
1972	33.2	135.4	186.1	216.9	240.9	195.5
1973	65.1	144.9	293.4	307.1	174.2	229.9
1974	45.7	103.4	152.0	266.7	141.8	195.9
1975	100.8	124.2	188.2	170.2	281.5	229.3
1976	82.8	169.9	79.2	-	158.8	223.3
1977	106.4	175.7	79.5	3.9	163.8	NA

Year	Quantity						
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Metric tons						
1962	79.0	112.7	86.8	155.2	154.2	139.7	1,188.2
1963	95.3	99.0	62.0	85.9	132.1	212.7	1,117.5
1964	170.1	150.4	62.0	61.9	170.4	45.6	921.6
1965	74.4	54.0	56.6	75.3	83.9	17.4	742.5
1966	41.8	53.3	75.6	56.0	48.2	60.6	815.1
1967	59.1	61.5	136.3	108.6	111.4	114.8	865.0
1968	115.1	105.3	125.5	107.7	142.4	163.3	1,427.2
1969	324.5	127.4	83.8	197.6	104.9	186.2	1,960.5
1970	142.7	126.4	122.3	153.8	120.0	120.0	2,033.0
1971	79.6	134.1	52.2	185.1	103.5	197.2	1,696.0
1972	203.0	165.5	122.2	170.3	93.7	205.3	1,968.0
1973	84.6	216.1	210.8	82.4	204.2	123.6	2,136.3
1974	415.7	159.2	272.6	121.6	207.1	208.5	2,290.2
1975	125.3	128.6	93.8	83.3	139.8	154.6	1,819.8
1976	201.2	135.5	135.9	228.9	202.8	154.5	1,772.8

Note: NA - Not available

Source: Ministério de Agricultura, SUDEPE, PNUD-FAO. 1977. Boletim do Mercado Pesqueiro 9(2):59.

Appendix G.--Brazil. Lobster exports to the United States, 1974-76

Commodity	1974		1975		1976	
	Quantity	Value	Quantity	Value	Quantity	Value
	Metric tons	US $1000	Metric tons	US $1000	Metric tons	US $1000
Frozen						
Tails	2,679.3	21,068.6	2,213.9	19,602.4	2,217.0	23,725.4
Other	128.7	1,140.9	162.3	1,418.0	134.5	1,514.4
Canned	-	-	9.3	82.7	-	-
Total	1/2,808.0	1/22,209.5	1/2,385.5	1/21,103.1	2,351.5	25,239.8
Total fishery exports	11,782.6	35,009.0	10,752.1	32,386.0	12,483.0	42.715.0
Lobster as a percent of fishery exports	24%	63%	22%	65%	19%	59%

1/ Statistical discrepencies with appendices H and I are unexplained.

Source: U.S. Department of Commerce, Bureau of the Census.

Appendix H.--Brazil. Quantity of frozen lobster exports, 1968-76

Destination	Year								
	1968	1969	1970	1971	1972	1973	1974	1975	1976
	Metric tons								
Argentina	5.0	15.0	7.0	0.5	3.2	-	-	-	-
Belgium-Luxemburg	-	-	0.4	-	-	-	-	9.5	6.3
Canada	48.4	-	-	47.6	-	-	-	-	-
Federal Republic of Germany	-	-	-	-	-	-	-	2.8	3.2
France	-	-	1.8	4.1	8.8	13.4	25.1	70.6	65.5
Italy	-	-	0.7	-	-	-	-	-	-
Japan	-	-	40.0	22.7	1.0	5.0	-	11.8	-
Netherlands	-	-	-	-	-	11.1	-	15.0	5.1
Paraguay	-	-	0.1	-	-	-	-	-	-
Portugal	-	-	-	9.5	3.7	-	-	-	-
Senegal	-	-	-	-	-	24.3	-	-	-
Spain	-	-	-	-	-	3.0	1.7	11.7	16.3
Switzerland	-	-	0.2	-	-	-	-	-	-
United Kingdom	-	-	-	-	-	0.5	-	-	-
United States	1,629.5	2,458.0	2,743.2	2,428.6	2,613.2	2,491.9	1/3,042.0	1/2,377.3	1/2,256.5
Uruguay	-	-	0.6	0.6	-	-	-	-	-
Total	1,682.9	2,473.0	2,794.0	2,513.6	2,629.9	2,549.2	3,068.8	2,498.7	2,352.9

1/ Statistical discrepancies with appendix G are unexplained.

Source: Ministério de Agricultura, SUDEPE, PNUD/FAO. 1976. Boletim do Mercado Pesqueiro 8(5):137 and 1977. Boletim do Mercado Pesqueiro 9(8):284.

Appendix I.--Brazil. Value of frozen lobster exports, 1968-76

Destination	Year								
	1968	1969	1970	1971	1972	1973	1974	1975	1976
	Metric tons								
Argentina	7.0	28.9	12.3	1.3	11.3	-	-	-	-
Belgium-Luxemburg	-	-	1.0	-	-	-	-	-	-
Canada	166.6	-	-	275.2	-	-	-	91.8	71.0
Federal Republic of Germany	-	-	-	-	-	-	-	27.1	34.7
France	-	-	3.2	10.2	27.4	53.2	237.4	583.1	741.1
Italy	-	-	1.4	-	-	-	-	-	-
Japan	-	-	113.3	64.3	3.5	33.0	-	60.2	-
Netherlands	-	-	-	-	-	74.1	-	135.3	55.7
Paraguay	-	-	0.4	-	-	-	-	-	-
Portugal	-	-	-	29.8	12.7	-	-	-	-
Senegal	-	-	-	-	-	189.6	-	-	-
Spain	-	-	-	-	-	11.8	9.3	67.6	107.0
Switzerland	-	-	0.7	-	-	-	-	-	-
United Kingdom	-	-	-	-	-	2.0	-	-	-
United States	5,312.6	10,204.7	9,909.7	12,454.7	16,299.2	17,668.9	1/27,611.6	1/20,569.2	1/25,867.0
Uruguay	-	-	0.7	0.7	-	-	-	-	-
Total	5,486.2	10,233.6	10,042.7	12,836.2	16,354.1	18,032.6	27,858.3	21,534.3	26,876.5

1/ Statistical discrepancies with appendix G are unexplained.

Source: Ministerio de Agricultura, SUDEPE, PNUD/FAO. 1976. Boletim do Mercado Pesqueiro 8(5):137 and 1977. Boletim do Mercado Pesqueiro 9(8):284.

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